

REMARKS/ARGUMENTS

Claims 1-32 were previously pending in the application. Claims 11-13, 16, 22-24, 27 and 30 are canceled; claims 1, 14-15, 17, 25-26, and 31-32 are amended; and new claims 33-39 are added herein. Assuming the entry of this amendment, claims 1-10, 14-15, 17-21, 25-26, 28-29, and 31-39 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In paragraphs 2-4, the Examiner objected to the specification and drawings and rejected claim 30 under 35 U.S.C. § 112, first paragraph, as failing to adequately disclose a comb drive with an electrostatic shield. In response, the Applicant canceled claim 30. The Applicant submits therefore that the objections to the specification and drawings and the rejection of the claims based on § 112, first paragraph, are now moot.

In paragraph 6, the Examiner rejected claims 1-9, 11, 17, 21, 22, 28, 30, and 31 under 35 U.S.C. § 102(b) as being anticipated by Rodgers. In paragraph 7, the Examiner rejected claim 31 under 35 U.S.C. § 102(b) as being anticipated by Tsukamoto. In paragraph 8, the Examiner rejected claims 1-10, 12, 14, 17-21, 23, 25, 28, and 30-32 under 35 U.S.C. § 102(e) as being anticipated by Ishii. In paragraph 9, the Examiner objected to claims 13, 15-16, 24, 26-27, and 29 as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten in independent form. For the following reasons, the Applicant submits that all now-pending claims are allowable over the cited references.

Claims 1-10, 14-15, 17-21, 25-26, 28-29, and 31-37:

Amended claims 1 and 17 are equivalent to original claims 13 and 24, respectively, rewritten in independent form. New claims 33, 35, and 37 are equivalent to original claims 15, 26, and 29, respectively, rewritten in independent form. Support for new claims 34 and 36 can be found in original claims 16 and 27, respectively. Since claims 13, 15, 24, 26, and 29 were indicated as allowable, the Applicant submits that claims 1, 17, 33, 35, and 37 are allowable. Since claims 2-10, 14-15, 18-21, 25-26, 28-29, 34, and 36 depend variously from claims 1, 17, 33, and 35, it is further submitted that those claims are also allowable.

Each of claims 31 and 32 is amended to include limitations that are analogous to those added herein to original claim 1. The Applicant submits that, for substantially the same reasons claim 1 is allowable, each of claims 31 and 32 is also allowable.

Claims 38-39:

New claim 38 is equivalent to original claim 8 rewritten in independent form. Claim 38 is directed to a method for use in making an electrostatic driving structure for an electrostatically driven device. The electrostatic driving structure has a first electrode in a first area of a surface of a dielectric and a second electrode in a second area of the surface of the dielectric that is spaced apart from the first area so as to define a gap on the dielectric surface between the first electrode and the second electrode. The method has the steps of: (A) disposing a first electrostatic shield made of non-insulating material on the electrostatic driving structure adjacent the gap; (B) electrically coupling the first electrostatic shield to a source of potential; and (C) disposing a shape-controlling structure on the electrostatic driving structure prior to disposing the first electrostatic shield, so that the shape of the first electrostatic shield formed is controlled

by the shape of the shape-controlling structure. The shape-controlling structure has a layer of material disposed on the electrodes and the gap, having an opening in the layer exposing an area of the electrostatic driving structure. The step of disposing the first electrostatic shield includes the steps of disposing non-insulating material on the exposed area of the electrostatic driving structure to a thickness greater than the thickness of the shape-controlling structure adjacent the opening, and then removing the shape-controlling structure.

Rodgers discloses a MEMS actuator having electrostatic comb drives configured with electrostatic shields designed to reduce unwanted electrostatic fields that interfere with the fields generated between the mated portions of the comb drives. A representative MEMS actuator is shown in Rodgers' Figs. 1-2 and its fabrication is shown in Figs. 3a-k. The MEMS actuator of Figs. 1 and 2 has electrostatic shields 40 and 42, each having a substantially rectangular cross-section. Figs. 3c-f show the fabrication process for electrostatic shield 42, while that for electrostatic shield 40 is not shown in the figures.

Rodgers' Fig. 3c shows a layer of sacrificial material 48 that serves as a shape-controlling structure for the process of forming electrostatic shield 42. Then, Rodgers' Fig. 3d clearly shows that an opening in sacrificial material 48 is filled with the material that forms electrostatic shield 42 to a thickness that is exactly the same as the thickness of sacrificial material 48. The Applicant submits that nowhere in the figures or specification does Rodgers teach or suggest the step of "disposing non-insulating material ... to a thickness greater than the thickness of the shape-controlling structure," as explicitly recited in claim 38. In view of this fact, the Applicant submits that the rejection of original claim 8 over Rodgers is improper and should be withdrawn, and that claim 38 is allowable over Rodgers.

Ishii discloses a MEMS switch having control electrodes 140, each formed by stacked conducting layers 141-144 (see, e.g., Ishii's Fig. 1A). Ishii's Figs. 4A-E show the fabrication process for control electrodes 140. For example, Fig. 4D shows that electrode layer 143 is formed by filling up an opening in sacrificial pattern 403 to "the same thickness as that of the sacrificial pattern 403" (see col. 9, lines 34-35). Ishii also describes fabrication procedures that are substantially similar to that of electrode layer 143 for the other stacked layers of control electrode 140 (see, e.g., col. 9, lines 9, 19, and 47). The Applicant submits that nowhere in the figures or specification does Ishii teach or suggest the step of "disposing non-insulating material ... to a thickness greater than the thickness of the shape-controlling structure," as explicitly recited in claim 38. In view of this fact, the Applicant submits that the rejection of original claim 8 over Ishii is improper and should be withdrawn, and that claim 38 is allowable over Ishii.

To summarize, the Applicant believes that claim 38 is allowable over Rodgers and Ishii. Since claim 39 depends from claim 38, the Applicant submits that claim 39 is also allowable over Rodgers and Ishii.

Claim 39 further specifies that "the cross-section of the first electrostatic shield is generally mushroom-shaped." Support for this limitation can be found, e.g., in original claim 29. The Applicant submits that none of the cited references teaches or suggests a similar limitation. This fact provides additional reasons for the allowability of claim 39 over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,



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